

AMENDMENT AFTER FINAL  
Reply to Office Action of March 19, 2004

Serial No.: 09/730,100  
Attorney Docket: Case 6121

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**Amendments to the Claims:**

The following list of claims will replace all prior versions and listing of claims in the application:

Claims 1-18 (canceled)

Claim 19 (currently amended) A method for controlling mercury emissions in an industrial process having a flue gas containing insoluble elemental mercury at a concentration of ~~less than 100~~ between 5-30  $\mu\text{g}/\text{Nm}^3$ , the method comprising:

a) providing the flue gas to a wet scrubber having an aqueous alkali scrubbing liquor;

b) mixing the flue gas with an oxidizing reagent containing chlorine in an amount ~~sufficient to convert all of the insoluble elemental mercury into a soluble mercury species that is at least double a stoichiometric ratio normally required to oxidize all of the insoluble elemental mercury present in the flue gas;~~

c) mixing the flue gas with a sulfide species using an interspatial header, said sulfide species provided in an amount sufficient to convert the soluble mercury species into insoluble mercuric sulfide;

d) wherein step (b) and step (c) occur separately so as to avoid unwanted reactions directly between the chlorine and the sulfide species;

e) creating a gas-liquid interface within the wet scrubber in order to: (i) entrain the insoluble mercuric sulfide generated by step (b) and step (c) within the scrubbing liquor and (ii) remove all mercury species from the flue gas; and

f) evacuating the mercury-free flue gas from the wet scrubber.

Claims 20-21 (canceled)

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Claim 22 (previously presented) A method according to claim 19, wherein the oxidizing reagent is an oxi-acid selected from the group consisting of:  $\text{Cl}_2\text{O}$ ,  $\text{ClO}_2$ ,  $\text{ClO}_4$ ,  $\text{ClO}$ ,  $\text{HClO}$ ,  $\text{HClO}_2$ ,  $\text{HClO}_3$ , and  $\text{HClO}_4$ .

Claim 23 (currently amended) A method according to claim ~~22~~ 19, wherein the sulfide species is selected from the group consisting of: hydrogen sulfide, aqueous hydrosulfide ions and aqueous sulfide ions.

Claims 24-25 (canceled)